



Meeting 3

Youth

Chair: Russ Pate

Members: Chuck Hillman, Kathy Janz, Peter Katzmarzyk, Ken Powell, Melicia Whitt-Glover

Subcommittee Members

Chair: Russ Pate, PhD
University of South
Carolina

Chuck Hillman, PhD
Northeastern University

Kathy Janz, EdD
University of Iowa

Peter Katzmarzyk, PhD
Pennington Biomedical
Research Center

Melicia Whitt-Glover, PhD
Gramercy Research Center

Ken Powell, MD, MPH

Federal Liaison: Deb Galuska, PhD
Centers for Disease Control and Prevention

ICF Liaison: Sondra Dietz

Subcommittee Questions

1. In children 5 years of age and younger, what is the relationship between physical activity and health outcomes?
2. In youth, what is the relationship between physical activity and health outcomes?
 - a. Is physical activity related to cardiorespiratory fitness, weight status, and other cardiometabolic risk factors?
 - b. Does physical activity prevent or reduce excessive weight gain that results in overweight or obesity?
 - c. Are muscle-strengthening and bone-strengthening physical activity related to musculoskeletal health?
 - d. Does recent evidence inform description of dose-response curves for established associations?
3. In youth, what is the relationship between sedentary behavior and health outcomes?

Question 1

- In children 5 years of age and younger, what is the relationship between physical activity and health outcomes?

Question 1 - Background



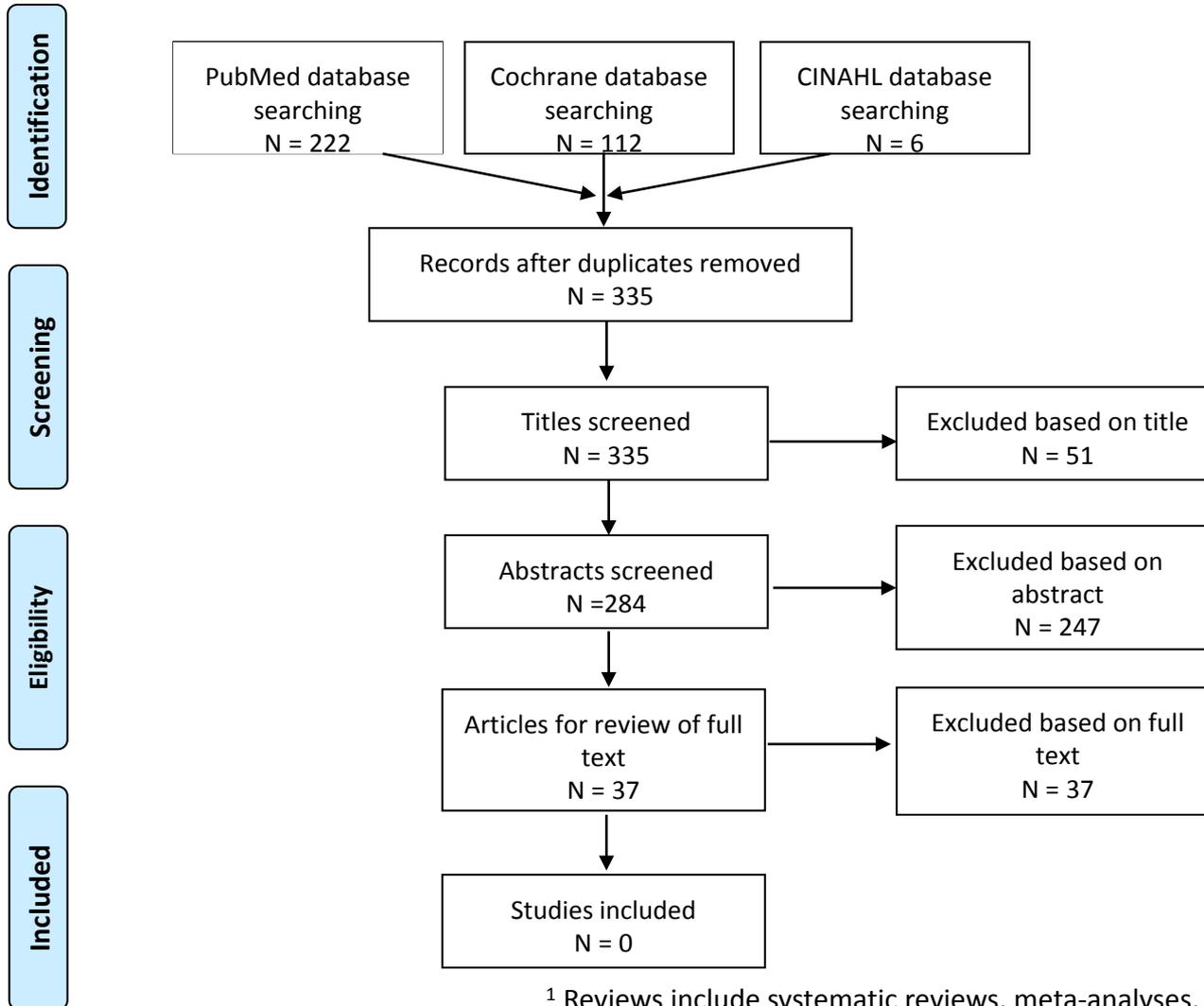
- Current guidelines do not address children under 6 years of age
- Much recent research has focused on physical activity during early childhood
- PA guidelines for this group have been issued in other countries
- Many policy developments in childcare settings

Question 1 – Search Process



- Phase 1
Systematic reviews and
meta-analyses

Search Results Q1: High Quality Reviews¹



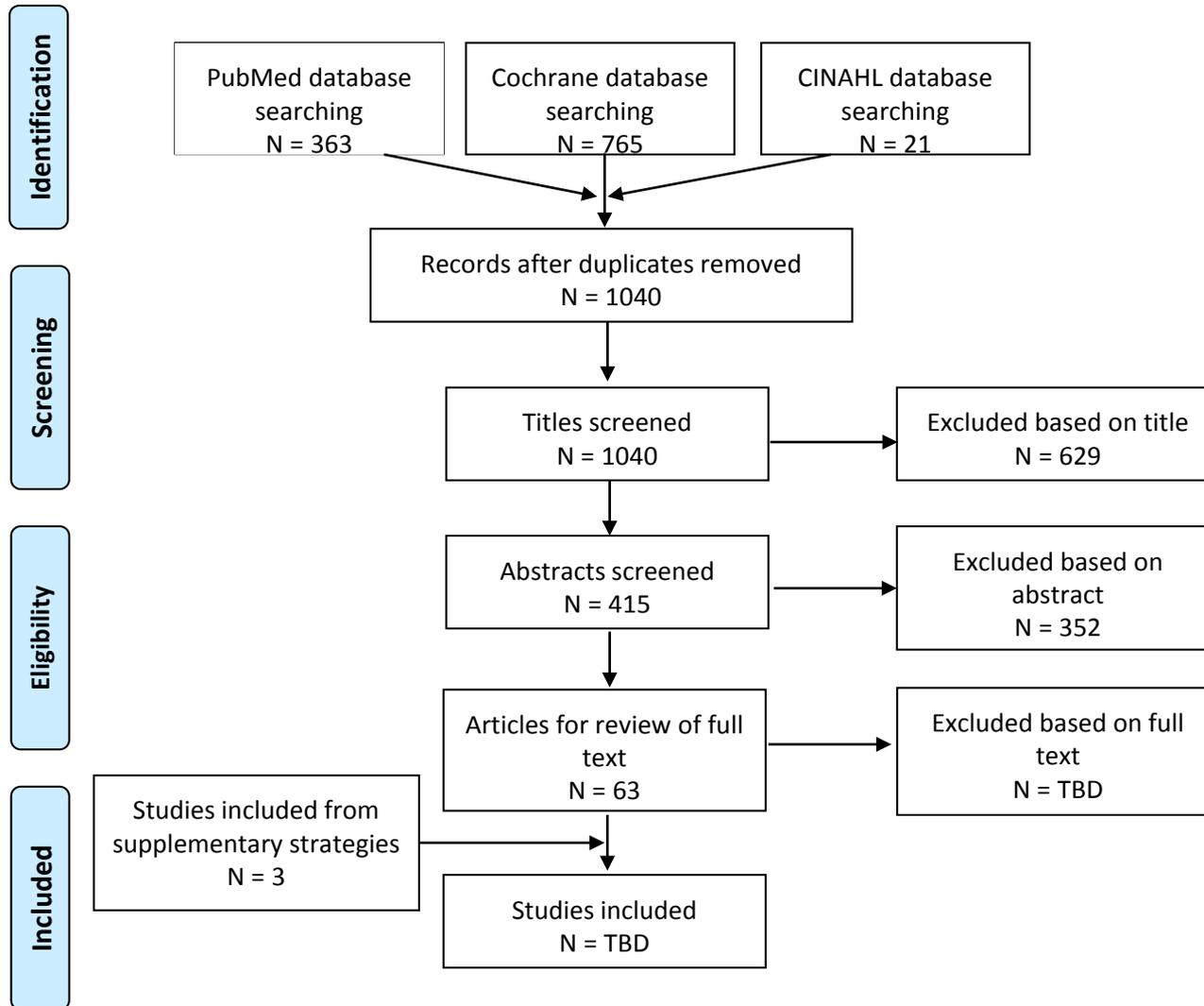
¹ Reviews include systematic reviews, meta-analyses, and pooled analyses.

Question 1 – Search Process



- Phase 2
Original Research

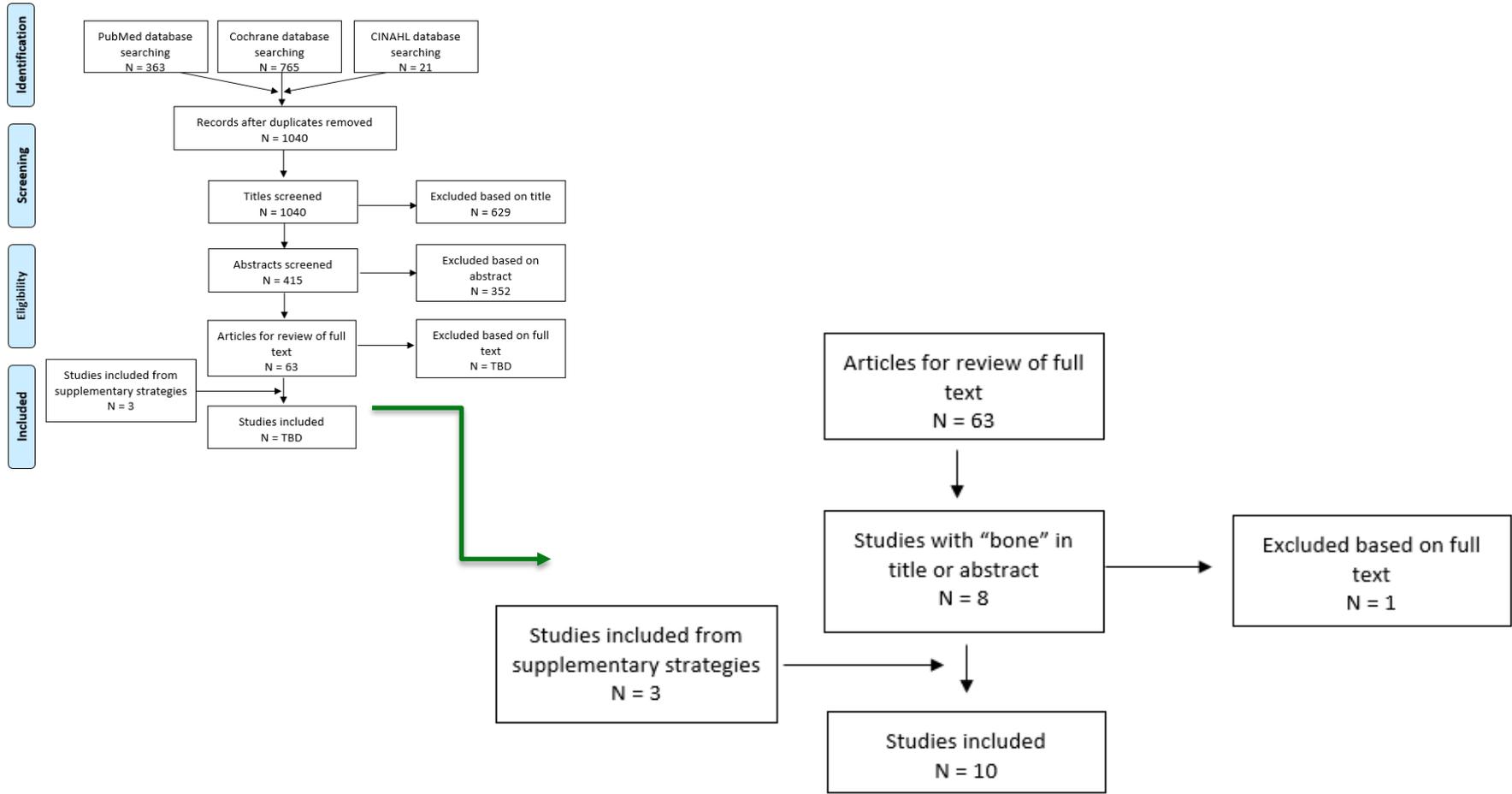
Search Results Q1: Original Research



Question 1

- Consideration of markers of Bone Health as Outcomes Related to Physical Activity in Early Childhood

Search Results Q1: Original Research (Bone)



Question 1

- Preliminary Conclusion to Bone Health Outcome
 - Primary literature search resulted in 10 papers relevant to bone health outcomes in children under 6
 - Higher levels of physical activity are associated with better bone-related outcomes in studies that examine
 - Overall physical activity
 - Specific physical activity exposure (e.g. gymnastics)
 - No conclusion about a specific dose-response relationship

Question 1

- Next steps:
 - Consider literature on other health outcomes
 - Focus on weight, fatness variables
 - Draw conclusions regarding answer to Question 1

Question 2

Subcommittee Member Assignments

In youth, what is the relationship between physical activity and health outcomes?

- a. Is physical activity related to cardiorespiratory fitness, weight status, and other cardiometabolic risk factors?
 - Cardiorespiratory fitness – Janz, Whitt-Glover, Hillman
 - Dyslipidemia, insulin resistance, blood pressure, waist circumference, and glucose – Katzmarzyk, Powell
- b. Does physical activity prevent or reduce excessive weight gain that results in overweight or obesity?
 - Pate, Katzmarzyk

Question 2

Subcommittee Member Assignments

In youth, what is the relationship between physical activity and health outcomes?

- c. Are muscle-strengthening and bone-strengthening physical activity related to musculoskeletal health?
 - Janz, Whitt-Glover, Hillman
- d. Does recent evidence inform description of dose-response curves for established associations?
 - Powell, Pate

Analytical Framework

Systematic Review Question

In youth, what is the relationship between physical activity and health outcomes?

Target Population

Children, ages 0–18

Comparison

Least active subgroup

Intervention/Exposure

All types and intensities of physical activity, including any kind of play (structured or free), sports, and other activities

Endpoint Health Outcomes

- Bone density
- Bone strength
- Cardiorespiratory fitness
- Cardiometabolic risk factors
 - Blood pressure
 - Dyslipidemia
 - Glucose
 - Insulin resistance
 - Waist circumference
- Musculoskeletal health
- Obesity
- Overweight
- Weight gain

Common Inclusion/Exclusion Criteria

- Language
 - Exclude: Studies that do not have full text in English
- Publication Status
 - Include: Studies published in peer-reviewed journals, PAGAC-approved reports
 - Exclude: Grey literature
- Study Subjects
 - Exclude: Studies of animals only

Inclusion/Exclusion Criteria



- **Date of Publication**
 - Original Research: Anytime
 - Existing Sources: Include 2006–Present
- **Study Subjects**
 - Include: Children ages 0–18
- **Study Design**
 - Include: Randomized controlled trials, Non-randomized controlled trials, Prospective cohort studies, Retrospective cohort studies, Case-control studies, Before-and-after studies, Time series, Systematic reviews, Meta-analyses, Pooled analyses, PAGAC-Approved reports
 - Exclude: Narrative reviews, Commentaries, Editorials, Cross-sectional, Study protocol
- **Exposure/Intervention**
 - Include: All types and intensities of physical activity
 - Exclude: Missing physical activity; Single, acute session of exercise; Therapeutic exercise; Physical fitness as the exposure; Only used as confounding variable
- **Outcome**
 - Include: Bone density, Bone strength, Cardiorespiratory fitness, Cardiometabolic risk factors (Blood pressure, Dyslipidemia, Glucose, Insulin resistance, Waist circumference), Musculoskeletal health, Obesity, Overweight, Weight gain

Search Terms: Physical Activity



Active games

Active play

Active recreation

Free play

High intensity activity(ies)

Low intensity activity(ies)

Moderate to vigorous activity(ies)

Muscle-strengthening

Outdoor play

Play and playthings

Recess

Recreational activity(ies)

Screen time

Television (TV) viewing

Television (TV) watching

Tummy Time

Video game

Video gaming

Vigorous activity(ies)

Walk

Youth sports

Search Terms: Outcome

Adiposity

Asthma

Blood glucose

Blood lipids

Blood pressure

Body composition

Body Mass Index

BMI

Bone density

Bone geometry

Bone mineral content

Bone mineral density

Cardiometabolic risk factor(s)

Diabetes Mellitus, Type 2

Dyslipidemia(s)

Fatness

Hyperglycemia

Hypertension

Insulin resistance

Metabolic syndrome

Metabolic syndrome X

Muscle mass

Musculoskeletal development

Musculoskeletal fitness

Obese

Obesity

Type 2 Diabetes

